

This Page Is Inserted by IFW Operations
and is not a part of the Official Record.

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

COMPLETE SPECIFICATION

(Section 30(1) - Regulation 28)

21	01	Official application No.	22	Lodging date	J&K Reference
929454			13th May, 1992		AP 29402 ZA/PJW
51	International classification				
E21C					
71	Full Name(s) of Applicant(s)				
THE ROBBINS COMPANY . A legal body organised and existing under the laws of the State of Washington of the United States of America.					
72	Full name(s) of Inventor(s)				
Thomas Martin HARTMAN, David B. SUGDEN.					
54	Title of invention				
MOBILE MINING MACHINE.					

WE CLAIM:

1. A mobile mining machine for cutting a tunnel in rock, comprising:

a wheel-like cutterhead assembly means for cutting rock, said cutterhead assembly means having a substantially horizontal axis of rotation and having multiple peripherally mounted roller cutter units;

rotation means for rotating said cutterhead assembly means about its horizontal axis;

pitch boom assembly means supporting said cutterhead assembly means, said pitch boom assembly means causing vertical movement of said cutterhead assembly means;

swing boom assembly means supporting said pitch boom assembly means, said swing boom assembly means causing horizontal movement of said cutterhead assembly means and said pitch boom assembly means;

frame means having front and rear portions supporting said swing boom assembly means;

thrust means mounted on said frame means between the front and rear portions thereof for thrusting forward as a unit the front portion of said frame means, said swing boom assembly means, said pitch boom assembly means and said cutterhead assembly means;

holding means for holding stationary the rear
25 portion of said frame means when said thrust
means is thrusting forward, said holding means being
adapted to anchor said rear portion of said frame means
relative to the tunnel; and

transport means for tramming said mobile mining
30 machine.

2. The mobile mining machine of claim 1, wherein said
front frame portion and said rear frame portion are
interconnected and adapted to reciprocate axially with
respect to each other.

3. The mobile mining machine of claim 2, wherein said
front frame portion and said rear frame portion are
interconnected by said thrust means, and said front frame
portion and said rear frame portion are axially rotatable
5 with respect to each other.

4. The mobile mining machine of claim 2, wherein said
holding means comprises:

fixed front support means having front support pad
means adapted to anchor against the tunnel floor and

5 front gripper cylinder means adapted to anchor against
the tunnel wall, said fixed front support means being
slidably mounted on said front frame portion on an axis
longitudinal of said mobile mining machine for relative
movement of said fixed front support means and said
10 front frame portion with respect to each other;

fixed rear support means having rear support pad
means adapted to anchor against the tunnel floor and
rear gripper cylinder means adapted to anchor against
the tunnel wall, said fixed rear support means being
15 fixedly mounted on said rear frame portion; and

attachment link means connecting said fixed front
support means and said fixed rear support means.

5. The mobile mining machine of claim 4, wherein
said transport means comprises:

front crawler means movable with respect to said
front frame portion by front lift cylinder means; and
5 rear crawler means movable with respect to said
rear frame portion by rear lift cylinder means whereby
retraction of said front lift cylinder means and said
rear lift cylinder means configures said mobile mining
machine in a gripping configuration in which said front
10 support pad means and said rear support pad means are
anchored against the tunnel floor, and extension of

said front lift cylinder means and said rear lift
cylinder means configures said mobile mining machine in
a re-gripping configuration in which said front crawler
means and said rear crawler means contact the tunnel
floor and support the machine, and whereby said front
frame portion moves forward relative to said fixed
front support means, said fixed rear support means, and
said rear frame portion due to forward thrusting of
said thrust means when said mobile mining machine is in
the gripping configuration, and said fixed front
support means, said fixed rear support means and said
rear frame portion move forward relative to said front
frame portion due to retraction from forward thrusting
by said thrust means when said mobile mining machine is
in the re-gripping configuration.

6. The mobile mining machine of claim 5, wherein
further extension of said front lift cylinder means and said
rear lift cylinder means configures said mobile mining
machine in a tramming configuration in which said front
support pad means and rear support pad means are raised from
the tunnel floor.

7. The mobile mining machine of claim 1, wherein said
pitch boom assembly means includes four pitch boom cylinders

attached to said pitch boom assembly means and to said swing boom assembly means.

8. The mobile mining machine of claim 1, wherein said swing boom assembly means includes two swing boom cylinders, attached to said swing boom assembly means and to said frame means.

9. The mobile mining machine of claim 1, further comprising:

a muck apron assembly including a substantially planar center section, a hopper on said center section having a conveyor feed opening adapted to communicate with muck conveyor means, substantially planar wing sections pivotally attached to ends of said center section, wing section swing cylinder means for pivotal movement of said wing sections between a substantially planar orientation with said center section and a substantially perpendicular orientation to said center section, and muck apron lift cylinder means for lifting and lowering said muck apron assembly relative to said mobile mining machine.

10. A mobile mining machine for cutting a tunnel in rock comprising:

a wheel-like cutterhead assembly means for cutting
rock, said cutterhead assembly means having a

5 substantially horizontal axis of rotation and having
multiple peripherally mounted roller cutter units;

rotation means for rotating said cutterhead
assembly means about its horizontal axis;

pitch boom assembly means supporting said
10 cutterhead assembly, said pitch boom assembly means
causing movement of said cutterhead assembly in a
vertical plane;

swing boom assembly means supporting said pitch
boom assembly means, said swing boom assembly means
15 causing movement of said cutterhead assembly and said
pitch boom assembly means in a horizontal plane;

frame means supporting said swing boom assembly
means, said frame means having a front frame portion
and a rear frame portion, said front frame portion and
20 said rear frame portion being interconnected and
adapted to reciprocate axially and to rotate with
respect to each other;

thrust means connecting said front frame portion
and said rear frame portion, said thrust means for
25 thrusting forward said front frame portion, said swing
boom assembly means, said pitch boom assembly means and
said cutterhead assembly means;

fixed front support means having a front support
pad means adapted to anchor against the tunnel floor,
30 and front gripper means adapted to anchor against the
tunnel wall, said fixed front support means being
slidably mounted on said front frame portion on an axis
longitudinal of said mobile mining machine for movement
of said fixed front support means and said front frame
35 portion with respect to each other;

fixed rear support means having rear support pad
means adapted to anchor against the tunnel floor and
rear gripper cylinder means adapted to anchor against
the tunnel wall, said fixed rear support means being
40 fixedly mounted on said rear frame portion;

attachment link means connecting said fixed front
support means and said fixed rear support means;

front crawler means movable with respect to said
front frame portion by front lift cylinder means; and

45 rear crawler means movable with respect to said
rear frame portion by rear lift cylinder means whereby
retraction of said front lift cylinder means and said
rear lift cylinder means configures said mobile mining
machine in a gripping configuration in which said front
50 support pad means and said rear support pad means are
anchored against the tunnel floor and whereby extension
of said lift cylinder means configures said mobile
mining machine in a re-gripping configuration in which

55 said front crawler means and said rear crawler means
contact the tunnel floor, such that said front
frame portion is moved forward relative to said fixed
front support means, said fixed rear support means and
said rear frame portion due to forward thrusting of
said thrust means when said mobile mining machine is in
60 the gripping configuration, and said fixed front
support means, said fixed rear support means and said
rear frame portion move forward relative to said front
frame portion due to retraction from forward thrusting,
by said thrust means when said mobile mining machine is
65 in the re-gripping configuration.

11. The mobile mining machine of claim 10, further
comprising:

5 a muck apron assembly including a substantially
planar center section, a hopper on said center section
having a conveyor feed opening adapted to communicate
with muck conveyor means, substantially planar wing
sections pivotally attached to ends of said center
section, wing section swing cylinder means for pivotal
movement of said wing sections between a substantially
10 planar orientation with said center section and a
substantially perpendicular orientation to said center
section, and apron lift cylinder means connecting said

11

muck apron assembly to the front of said mobile mining machine for lifting and lowering said muck apron assembly relative to said mobile mining machine.

15

12. A holding apparatus for a mobile mining machine having a front frame portion and a rear frame portion interconnected by thrust means and adapted to reciprocate axially with respect to each other, said holding apparatus comprising:

5

fixed front support means having front support pad means adapted to anchor against the tunnel floor and front gripper cylinder means adapted to anchor against the tunnel wall, said fixed front support means being mounted on the front frame portion to move on an axis longitudinal of said mobile mining machine for movement of said fixed front support means and the front frame portion with respect to each other;

10

fixed rear support means having rear support pad means adapted to anchor against the tunnel floor and rear gripper cylinder means adapted to anchor against the tunnel wall, said fixed rear support means fixedly mounted on the rear frame portion; and

15

20 attachment link means connecting said fixed front
support means and said fixed rear support means.

13. The holding apparatus of claim 12, wherein the
mobile mining machine includes front crawler means connected
to the front frame portion and rear crawler means connected
to the rear frame portion, said holding apparatus further
5 comprising:

front lift cylinder means connecting the front
crawler means and the front frame portion; and
rear lift cylinder means connecting the rear
crawler means and the rear frame portion whereby
10 actuation of said front lift cylinder means and said
rear lift cylinder means configures the mobile mining
machine in a gripping configuration in which said front
support pad means and said rear support pad means are
anchored against the tunnel floor and in a re-gripping
15 configuration in which said front crawler means and
said rear crawler means contact the tunnel floor
without the support pad means being in load supporting
contact with the tunnel floor, and whereby the front
frame portion moves forward relative to said fixed
20 front support means, said fixed rear support means, and
the rear frame portion when the mobile mining machine
is in the gripping configuration and the thrust means

25

thrusts forward, and said fixed front support means, said fixed rear support means and the rear frame portion move forward relative to the front frame portion when said mobile mining machine is in the re-gripping configuration and the thrust means retracts from forward thrusting.

14. The mobile mining machine of claim 13, wherein further extension of said front lift cylinder means and said rear lift cylinder means configures said mobile mining machine in a tramming configuration in which said front support pad means and said rear support pad means are raised from the tunnel floor.

15. The holding apparatus of claim 12, further comprising:

5 guide column means slidably mounted in a guide column channel in said front frame portion for sliding movement of said fixed front support means and the front frame portion with respect to each other; and

10 support trunnion means mounted in a cavity of the front frame portion and fixedly attached to said guide column means, said support trunnion being connected to said front gripper cylinder means and being sized smaller than the cavity for sliding movement of said

support trunnion means in the cavity upon sliding movement of said fixed front support means and the front frame portion with respect to each other.

16. A muck apron assembly for a mobile mining machine comprising:

a substantially planar center section;

5 a hopper on said center section having a conveyor feed opening adapted to communicate with muck conveyor means;

substantially planar wing sections pivotally attached to ends of said center section;

10 wing section swing cylinder means for pivotal movement of said wing sections between a substantially planar orientation with said center section and a substantially perpendicular orientation to said center section; and

15 muck apron lift cylinder means connecting for lift-up and lowering said muck apron assembly relative to the mobile mining machine.

17. A cutterhead positioning assembly for a mobile mining machine having a cutterhead and a frame, said cutterhead positioning assembly comprising:

pitch boom assembly means supporting said
cutterhead and causing vertical movement of said
cutterhead; and

swing boom assembly means supported by the frame,
said swing boom assembly supporting said pitch boom
assembly means and causing horizontal movement of said
cutterhead and said pitch boom assembly means.

18. The cutterhead positioning assembly of claim 17,
wherein said pitch boom assembly means includes four pitch
boom cylinders attached to the pitch boom assembly means and
to said swing boom assembly means.

19. The cutterhead positioning assembly of claim 17,
wherein said swing boom assembly includes two swing boom
cylinders attached to said swing boom assembly means and to
the frame of the mobile mining machine.

20. A mobile mining machine for cutting a tunnel in rock
substantially as herein described with reference to and as illustrated
in any one of figures 1 to 11.

DATED THIS 12 DAY OF MAY 1992.


JOHN & KERNICK
FOR THE APPLICANT

20 attachment link means connecting said fixed front support means and said fixed rear support means.

13. The holding apparatus of claim 12, wherein the mobile mining machine includes front crawler means connected to the front frame portion and rear crawler means connected to the rear frame portion, said holding apparatus further comprising:

front lift cylinder means connecting the front crawler means and the front frame portion; and rear lift cylinder means connecting the rear crawler means and the rear frame portion whereby actuation of said front lift cylinder means and said rear lift cylinder means configures the mobile mining machine in a gripping configuration in which said front support pad means and said rear support pad means are anchored against the tunnel floor and in a re-gripping configuration in which said front crawler means and said rear crawler means contact the tunnel floor without the support pad means being in load supporting contact with the tunnel floor, and whereby the front frame portion moves forward relative to said fixed front support means, said fixed rear support means, and the rear frame portion when the mobile mining machine is in the gripping configuration and the thrust means

25

thrusts forward, and said fixed front support means, said fixed rear support means and the rear frame portion move forward relative to the front frame portion when said mobile mining machine is in the re-gripping configuration and the thrust means retracts from forward thrusting.

14. The mobile mining machine of claim 13, wherein further extension of said front lift cylinder means and said rear lift cylinder means configures said mobile mining machine in a tramming configuration in which said front support pad means and said rear support pad means are raised from the tunnel floor.

15. The holding apparatus of claim 12, further comprising:

5 guide column means slidably mounted in a guide column channel in said front frame portion for sliding movement of said fixed front support means and the front frame portion with respect to each other; and

10 support trunnion means mounted in a cavity of the front frame portion and fixedly attached to said guide column means, said support trunnion being connected to said front gripper cylinder means and being sized smaller than the cavity for sliding movement of said

support trunnion means in the cavity upon sliding movement of said fixed front support means and the front frame portion with respect to each other.

16. A muck apron assembly for a mobile mining machine comprising:

a substantially planar center section;

5 a hopper on said center section having a conveyor feed opening adapted to communicate with muck conveyor means;

substantially planar wing sections pivotally attached to ends of said center section;

10 wing section swing cylinder means for pivotal movement of said wing sections between a substantially planar orientation with said center section and a substantially perpendicular orientation to said center section; and

15 muck apron lift cylinder means connecting for lift-up and lowering said muck apron assembly relative to the mobile mining machine.

17. A cutterhead positioning assembly for a mobile mining machine having a cutterhead and a frame, said cutterhead positioning assembly comprising:

5
pitch boom assembly means supporting said
cutterhead and causing vertical movement of said
cutterhead; and

swing boom assembly means supported by the frame,
said swing boom assembly supporting said pitch boom
assembly means and causing horizontal movement of said
cutterhead and said pitch boom assembly means.

10

18. The cutterhead positioning assembly of claim 17,
wherein said pitch boom assembly means includes four pitch
boom cylinders attached to the pitch boom assembly means and
to said swing boom assembly means.

19. The cutterhead positioning assembly of claim 17,
wherein said swing boom assembly includes two swing boom
cylinders attached to said swing boom assembly means and to
the frame of the mobile mining machine.

20. A mobile mining machine for cutting a tunnel in rock
substantially as herein described with reference to and as illustrated
in any one of figures 1 to 11.

DATED THIS 12 DAY OF MAY 1992.


JOHN & KERNICK
FOR THE APPLICANT